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EFFECT OF FIRST-GRADE INSTRUCTION USING BASAL READERS, MODIFIED LINGUISTIC MATERIALS, AND LINGUISTIC READERS.

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THIS STUDY EVALUATED THE EFFECTS OF A BASAL READER PROGRAM, A MODIFIED LINGUISTIC APPROACH, AND A LINGUISTIC READER PROGRAM AS MEASURED BY THE READING ACHIEVEMENT OF 469 CHILDREN IN 21 CLASSES AT THE END OF FIRST GRADE. ACHIEVEMENT COMPARIONS WERE ALSO MADE ON THE BASES OF (1) SEX, (2) INTELLIGENCE, AND (3) RELATIONSHIPS BETWEEN READING READINESS TEST SCORES AT THE BEGINNING OF GRADE ONE AND SUBSEQUENT ACHIEVEMENT AT THE END OF THE SCHOOL YEAR. ANALYSIS OF THE PRE- AND POST-TEST SCORES AND INFORMATION GAINED DURING THE ACTUAL INSTRUCTIONAL SESSIONS INDICATED THAT NO ONE OF THE THREE APPROACHES WAS MORE EFFECTIVE IN TEACHING BEGINNING READING. EXAMINATION OF THE VARIOUS ACHIEVEMENT MEASURES FROM ALL THREE TREATMENT GROUPS INDICATED THAT MOST OF THE CHILDREN LEARNED TO READ AT ACCEPTABLE LEVELS. (JH)

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EFFECT OF FIRST GRADE INSTRUCTION USING BASAL READERS, MODIFIED LINGUISTIC MATERIALS AND LINGUISTIC READERS

Cooperative Research Project No. 2683

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Syracuse University
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1966

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CHAPTER I -- PROBLEM AND PURPOSES

The main purpose of the U. S. Office of Education--Syracuse University First Grade Reading Study was to determine the effect of three different approaches to the teaching of beginning reading as measured by the achievement of children completing the first grade. The study also investigated the reading achievement of boys as compared to girls; the achievement of children categorized as high, average, or low in mental ability; the strength of relationship between readiness test scores and subsequent achievement.

The study was part of a larger, cooperative effort sponsored by the U. S. Office of Education. The total program included twenty-seven studies dealing with one aspect or another of the problem of teaching beginning reading. The effort was cooperative in the sense that a Coordinating Center was established at the University of Minnesota and the twenty-seven project directors, at various meetings and conferences, agreed on common measures of achievement to be administered and common background data to be collected. Each of the twenty-seven studies will be reported individually. In addition, a comprehensive analysis of the data from the individual studies will be done by the Coordinating Center research staff under the direction of Dr. Guy Bond and Dr. Robert Dykstra.

Problem

In examining the history of reading instruction in the United States, much of the discussion centers on the value of different approaches to the teaching of beginning reading. Recently, there has been much criticism leveled at basal readers by advocates of phonic or linguistic programs. More specifically, critics such as Flesch[1] have proposed a method for teaching reading based on only one skill--phonic analysis. Linguists have also made proposals based on the findings of their scientific study of language. Both Fries[2] and Bloomfield-Barnhart[3], as well as others, have advocated materials for teaching beginning reading which are based on linguistic findings.

An examination of the related research reveals that there are conflicting reports on the value of phonic programs versus basal readers. In addition, there are very few controlled studies of the effect of linguistic materials as compared to basal readers. No study could be found which involved all three of these approaches to the teaching of beginning reading.

It is reasonable to assume that different children will profit from different types of instructional materials when basic instructional practices are controlled. That is, the inconsistency of the grapheme-phoneme relationships in our language might well be a major source of confusion to the low ability child. If this child were to experience

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[1]Rudolf Flesch, Why Johnny Can't Read (New York: Harper and Brothers, 1955).

[2]Charles C. Fries, Linguistics and Reading (New York: Holt, Rinehart and Winston, Inc., 1962).

[3]Leonard Bloomfield and Clarence L. Barnhart, Let's Read: A Linguistic Approach (Detroit: Wayne State University Press, 1961).

a program based on linguistic or phonic principles, would this confusion be alleviated? At the other extreme, would the high ability child necessarily need the structure of the linguistic readers or would this child profit to a greater degree from instruction in a basal reading series?

Purposes

1. To determine the effect of three approaches (a basal reader program, modified linguistic materials, linguistic readers) to the teaching of beginning reading as measured by the achievement of children completing the first grade.
2. To determine the achievement of boys as compared to girls.
3. To determine the effect of instruction on children of high, average, and low mental abilities.
4. To further explore the relationship between readiness test scores and subsequent achievement at the end of grade one.

Definitions

1. Basal reader program--the basic instructional material used by the children in seven classrooms. The particular series chosen for use in this study was the Ginn Basic Reading Series by David H. Russell and others.[4]
2. Modified linguistic materials--the basis for instruction in seven classrooms. The particular series chosen was

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[4]David H. Russell and others, Ginn Basic Reading Series (Boston: Ginn and Company, 1964).

the Structural Reading Series by Catherine Stern and others.[5]

3. Linguistic readers--the materials used for instruction in seven classrooms. The material chosen was the Let's Read series by Leonard Bloomfield and Clarence Barnhart.[6]
4. Reading achievement--measurement of reading skills as determined by the Stanford Achievement Test, Primary I Battery,[7] the Gilmore Oral Reading Test,[8] and the Allyn and Bacon First Reader Test.[9]
5. Mental ability--the mental age as determined by performance on the Pintner-Cunningham Primary Test, Form A.[10]
6. Readiness--that information on children which was derived from the Metropolitan Readiness Test,[11] the Murphy-Durrell

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[5]Catherine Stern and others, Structural Reading Series (Syracuse, New York: L. W. Singer Company, Inc., 1963).

[6]Leonard Bloomfield and Clarence L. Barnhart, Let's Read (Bronxville, New York: C. L. Barnhart, Inc., 1963).

[7]Truman L. Kelley and others, Stanford Achievement Test, Primary I Battery, Form W (New York: Harcourt, Brace and World, Inc., 1964).

[8]John V. Gilmore, Gilmore Oral Reading Test (New York: Harcourt, Brace and World, Inc., 1952).

[9]William D. Sheldon and others, Reading Achievement Tests, First Reader Test, Form I (Boston: Allyn and Bacon, Inc., 1963).

[10]Rudolph Pintner and others, Pintner-Cunningham Primary Test, Form A (New York: Harcourt, Brace and World, Inc., 1964).

[11]Gertrude Hildreth and others, Metropolitan Readiness Tests (New York: Harcourt, Brace and World, Inc., 1964).

Diagnostic Reading Readiness Test,[12] the Thurstone Identical Forms Test,[13] the Thurstone Pattern Copying Test,[14] and the Allyn and Bacon Pre-Reading Test.[15]

7. Listening-viewing--that procedure by which selected children were exposed to listening and viewing experiences through the use of a tape recorder, a film strip projector, a record player, a jack-box containing eight sets of head-phones, a small screen, and film strips, records and tapes of both the commercially available type and the teacher-made type.

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[12]Helen Murphy and Donald Durrell, Murphy-Durrell Diagnostic Reading Readiness Test, Revised Edition (New York: Harcourt, Brace and World, Inc., 1964).

[13]Printed for use in the 27 USOE First Grade Studies.

[14]Printed for use in the 27 USOE First Grade Studies.

[15]William D. Sheldon and others, Reading Achievement Tests, Pre-Reading Test, Form I (Boston: Allyn and Bacon, Inc., 1963).

CHAPTER II -- REVIEW OF RELATED RESEARCH

An examination of books and articles written during the past ten years on the teaching of beginning reading reveals conflicting results in many of the controlled studies. In addition to those writings dealing with experimentation, one finds an abundance of opinions on materials and methods coming from a wide range of critics of education.

One of the most widely known of the critical works was the publication Why Johnny Can't Read by Rudolf Flesch.[1] In it he attacked American reading instruction on the basis that only a whole-word approach was being used in teaching children to read. He advocated, in its place, the teaching of reading based on only one skill--phonic analysis. His work also included a series of seventy-two lessons designed to teach the young child to read. In response to Flesch's comments and other similar criticisms, the Carnegie Corporation of New York sponsored a conference during the fall of 1961. This meeting was held at the request of James B. Conant and was attended by twenty-eight well known writers on reading instruction. The outcome of this meeting was a booklet entitled Learning to Read, which included a lengthy statement concerning the place of phonics in the total reading program.[2] This statement was approved by twenty-seven of

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[1]Rudolf Flesch, Why Johnny Can't Read (New York: Harper and Brothers, 1955).

[2]Learning to Read: A Report of a Conference of Reading Experts (Princeton, New Jersey: Educational Testing Service, 1962).

the writers. The one dissenting individual submitted a separate opinion in which increased emphasis on phonics instruction was urged.

In contrast to the opinions of critics of reading instruction one also finds many studies on the value of phonics. Russell and Fea state that "more has been written on phonics in the past five years than on any other aspect of the teaching of reading."[3] To select pertinent studies from this collection is difficult because of the problem of uncontrolled variables in many of the "phonics versus basic reader" experiments.

Sparks and Fay[4] conducted one of the few studies comparing the effects of a basic reading program and an intensive phonetic[5] approach over a long period of time. They examined the achievement of children taught by one of these two approaches at the end of grades one, two, and three and again during grade four. At the end of grade two the phonetics approach produced superior achievement in comprehension while the initial lead in reading vocabulary was no longer present. At the end of grade three and during grade four no significant differences were found between the two groups which had used the two approaches. The authors concluded that the basic reading program introduced enough phonetic training to provide the

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[3]David H. Russell and Henry R. Fea, "Research on Teaching Reading," Handbook of Research on Teaching, N. L. Gage, editor (Chicago: Rand McNally and Co., 1963), 875.

[4]Paul E. Sparks and Leo C. Fay, "An Evaluation of Two Methods of Teaching Reading," Elementary School Journal, LVII (April, 1957), 386-90.

[5]The writer is aware of the differentiation between "phonics" and "phonetics". In discussing the studies included in this chapter, the terminology used by the investigator who conducted the study is being reported.

children with the word attack skills necessary to success in reading.

Another three year study designed to examine the effect of a phonetic program and a "traditional approach" was carried out by Henderson.[6] She reported results at the end of grade three which significantly favored the experimental (phonetic) group in all cases. Her results included an examination of the mean scores on four different well known tests which produced a total of fourteen scores. Ten of the mean differences were found to be significant at the .01 level; the other four were significant at the .05 level. Once again, all differences favored the group which had had the phonetic training. It is difficult to determine the exact nature of this experiment because of the lack of information on the "traditional approach." At no time did the author explain the materials or the methods used in the control classes. Furthermore, the comments of the experimental teachers indicated that a great deal of extra effort and enthusiasm prevailed in the experimental classes. No mention was made of the activities or the attitudes exhibited by the control teachers.

Bear conducted a study which evaluated a synthetic phonics program and an analytic method.[7] Both control and experimental groups followed the same basal reader program with the exception of the method of introducing phonics. The control group was exposed

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[6]Margaret G. Henderson, Progress Report of Reading Study: 1952-1955 (Champaign, Illinois: Community Unit School District No. 4, no date).

[7]David E. Bear, "Phonics for First Grade: A Comparison of Two Methods," Elementary School Journal, XLIX (April, 1959), 394-402.

to the phonics program of the basal reader according to the dictates of the manual while the experimental group experienced phonic instruction from a phonics reader, phonics workbooks, and picture cards during a thirty minute period each day. The total time spent in daily instruction was the same for both groups. At the end of the first semester of grade one the two methods were found to be equally effective. By the end of the second semester, however, the testing program indicated that low and middle ability groups achieved higher results with instruction being the synthetic approach. Little difference in performance was noted between the high ability groups receiving the synthetic or the analytic instruction.

A study by Bloomer compared the achievement of two first grade classes at the end of one year of instruction.[8] The control group followed a regular basal reading program for the entire year while the experimental class began the year with a formal phonic method which was followed by a sight vocabulary approach of teaching reading. That is, after a reading readiness program from a basal reader, the experimental group was exposed to sixteen weeks of formal phonics. This, in turn, was followed by eight weeks of instruction in a basal reader series. The phonics program in the readers was not taught to the experimental group. Results indicated that the experimental program produced significantly higher results in the areas of word recognition and sentence reading than did the control

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[8]Richard H. Bloomer, "An Investigation of an Experimental First Grade Phonics Program," Journal of Educational Research, LIII (January, 1960), 188-193.

group instruction. Furthermore, it was found that the subjects who had experienced the experimental program were more uniform in the skills measured. Bloomer concludes by stating that formal phonics training prior to the usual basal reader instruction produces the superior results found in this study. He makes no comment concerning the possible effect of teachers' attitudes on the achievement levels of the two classes.

A recent study by Bliesmer and Yarborough compared the effects of ten different beginning reading programs on a population of 596 children in twenty classrooms.[9] Five of the programs represented an analytic approach as found in three basal reader programs and two individualized reading systems. The remaining five programs represented a synthetic method of teaching beginning reading skills. Results of this study show that 92 out of 125 differences among achievement test means were found to be significant in favor of the synthetic group. In only three cases were the differences found to favor the analytic group. The authors also cite evidence to dispute the claim that an analytic approach does not give proper emphasis to the building of comprehension skills. In the area of paragraph reading they found that in twenty out of twenty-five instances significant differences were found favoring the synthetic group while only one difference (not significant) was noted in favor of the analytic group.

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[9]Emery P. Bliesmer and Betty H. Yarborough, "A Comparison of Ten Different Beginning Reading Programs in First Grade," Phi Delta Kappan, XLVI (June, 1965), 500-504.

The results of the studies described above encourage the reader to come to two conclusions:

1. a synthetic approach to phonics seems to produce superior achievement as compared to analytic methods found in most basal readers and advocated by the majority of the current writers on reading instruction.
2. over an extended period of time inconclusive results are found concerning the effectiveness of synthetic and analytic approaches.

During the past five years there has been increased attention paid to those who propose the teaching of beginning reading by using materials based on linguistic findings. Professional organizations such as the National Council of Teachers of English and the International Reading Association have provided workshops dealing with linguistics and reading at their annual conventions. In addition, professional journals are publishing a rapidly increasing number of articles dealing with this topic. Unfortunately, very few of these articles involve attempts to evaluate linguistically-based instructional materials in well-controlled, classroom experimentation. Rather, most comments have tried to explain the value or the weaknesses of such materials.

One of the few reports of a beginning reading program using linguistic materials was presented by Goldberg and Rasmussen.[10]

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[10]Lynn Goldberg and Donald Rasmussen, "Linguistics and Reading," Elementary English, XL (March, 1963), 242-247.

They attempted no formal evaluation of their program but they felt that their phonemic-word approach was successful in teaching children in their school to read. Furthermore, they were more than satisfied with the pace at which the children learned.

Sister Mary Fidelia compared the effectiveness of the Bloomfield linguistic approach and a phonics program and found no significant differences between the mean scores of the control and experimental groups in the areas of total reading, paragraph meaning, and word meaning.[11] However, she stated that a full evaluation of the Bloomfield approach could be made only after the children had completed the entire program. That is, by the end of grade one the subjects in her study had not experienced the Bloomfield approach in its entirety.

Another study involving a linguistic approach compared a modified linguistic versus a basal reading program.[12] The subjects had received instruction in one of the two approaches for three years and analysis of data was done at the beginning of the fourth year of instruction. The findings show that:

> although both samples performed above the national norms on all reading tests, the boys and girls of the experimental group recognized words in isolation more readily, used context with greater facility, had fewer orientation problems, possessed greater ability to analyze words visually and had greater phonetic knowledge than boys and girls taught with the control method. There was no significant difference between the two samples in their ability to synthesize words.[13]

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[11]Sister Mary Fidelia, "Bloomfield's Linguistic Approach to Word-Attack" (Unpublished doctoral dissertation, Department of Education and Psychology, University of Ottawa, 1959).

[12]Sister Mary Edward, "A Modified Linguistic Versus a Composite Basal Reading Program," Reading Teacher, XVII (April, 1964), 511-15.

[13]Ibid., p. 512.

It was found that all children benefited from instruction in the modified linguistic (experimental) approach. However, low and average ability groups appeared to profit more greatly than did children of high ability in the experimental group. Unfortunately, no information was available in this report on the relative achievement of the two groups at the end of grades one and two.

Because of the scarcity of controlled experimentation with linguistic approaches and the conflicting findings of the many phonics and basal reader studies, the research described in the following chapter was planned and carried out.

CHAPTER III -- PROCEDURES

Introduction

The study described in this chapter was one of twenty-seven research studies on teaching beginning reading conducted during the 1964-65 academic year with the support of the United States Office of Education. Each of the twenty-seven programs maintained its own identity by concentrating its attention on some aspect of beginning reading which was determined by the individual project director. In addition, the venture was cooperative in that the project directors agreed upon the use of common testing instruments and the collection of common data, so that comparisons among the various studies could be accomplished. To facilitate this cooperative approach a Coordinating Center was established at the University of Minnesota.

Each of the twenty-seven projects will be reported individually; a comprehensive analysis of the data from all of the studies will be conducted by the research staff of the Coordinating Center.

Selection of the Sample

During the spring of 1964 the project director contacted the chief school officer and the person responsible for elementary curriculum in each of three central New York school systems. The proposed study was explained and discussed in detail and complete cooperation was promised by the three systems.

The three elementary supervisors contacted first grade teachers during the summer of 1964 and secured the names of those teachers

who wished to participate in the study. Twenty-one teachers, seven from each of the three districts, agreed to subsequent placement in any one of the three treatment groups. The children assigned to these twenty-one volunteer teachers made up the sample for this study. Formation of these classes was completed at the end of the kindergarten year by the officials of the three districts. The administrative procedures usually employed in each district formed the basis for placement in any particular class.

During the first week of August, 1964, the research staff assigned each teacher to one of the three treatment groups by means of a table of random numbers. Table I shows the number of classes from each school district within each treatment group.

TABLE I

ASSIGNMENT OF CLASSES TO TREATMENT GROUPS

	School Districts		
	A	B	C
Basal Reader Program	2	3	2
Modified Linguistic Materials	2	2	3
Linguistic Readers	3	2	2

Pre-Experiment Activities

During the first week of school in September, 1964, the project director met with the twenty-one classroom teachers, the principals of the sixteen schools in which the classrooms were located, and the research staff. At this session the activities of the coming year were explained to the teachers and principals, and the teachers were informed of their placement in the treatment groups.

Later in the same week each group of seven teachers assigned to the same program participated in a two-day workshop on the proper use of the materials to be used in their classes. These two-day sessions were conducted by representatives of the three companies which publish the materials. In all three workshops the format was the same. That is, instruction and discussion were based on:

1. the philosophy or rationale of the program
2. the materials of the program
3. teaching procedures most effective in using the materials.

The workshops for the three groups of teachers using the different programs were considered necessary because of the experience with instructional materials that the teachers had had previously. Without exception, the teachers were basal reader oriented in both training and experience. Yet, fourteen of these teachers were expected to remove themselves from this orientation and to assume a new attitude concerning materials and rationale of the particular program to which they had been assigned.

Pre-Testing of Sample

An extensive pre-testing of the children took place during the last two weeks of September. Those tests which were agreed upon by the twenty-seven project directors were administered along with one test chosen by the project director at Syracuse. All tests were administered under the direction of the research staff and the teachers. That is, each teacher tested only a part of her total class while the research staff member tested the remaining children. All test scoring was completed by the research staff and clerical workers; no teachers were asked to score tests for her class.

Of the five pre-testing instruments common to all the studies three were the latest revised editions which were made available by the publisher to the twenty-seven projects. These included the Pintner-Cunningham Primary Test, Form A;[1] the Metropolitan Readiness Test;[2] and the Murphy-Durrell Diagnostic Reading Readiness Test.[3] The remaining two tests were special printings of the Thurstone Pattern Copying[4] and the Thurstone Identical Forms[5] tests. The one instrument chosen

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[1]Rudolph Pintner and others, Pintner-Cunningham Primary Test, Form A (New York: Harcourt, Brace and World, Inc., 1964).

[2]Gertrude Hildreth and others, Metropolitan Readiness Tests (New York: Harcourt, Brace and World, Inc., 1964).

[3]Helen Murphy and Donald Durrell, Murphy-Durrell Diagnostic Reading Readiness Test, Revised Edition (New York: Harcourt, Brace and World, Inc., 1964).

[4]Printed for use in the 27 USOE First Grade Studies.

[5]Printed for use in the 27 USOE First Grade Studies.

by this project director for use in this study only was the Allyn and Bacon Pre-Reading Test.[6]

Instructional Period

Instruction of the children in the three treatment groups took place during a period of 140 days extending from late September, 1964, to May, 1965. During this time periodic meetings with each group of seven teachers using the same materials were held by the research staff in order to clarify questions on materials and methodology as well as to share teaching techniques. Some of these meetings were also attended by the representatives of the company which published the program used by the seven teachers. It was found that these gatherings were beneficial to all three groups of teachers in that they often realized that other teachers in the particular treatment group were experiencing similar difficulties. Furthermore, these meetings were a necessity for those teachers assigned to the modified linguistic and the linguistic programs because of the new approaches represented. The basic reader teachers also benefited in that the Ginn program was a newly-adopted series for five of the seven.

It was interesting to note the reactions of the two groups of teachers using the modified linguistic and linguistic programs. The materials of these two approaches were so foreign to their previous experiences that the teachers were apprehensive about using them. However, as the teachers began working with the materials and learning

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[6]William D. Sheldon and others, Reading Achievement Tests, Pre-Reading Test, Form I (Boston: Allyn and Bacon, Inc., 1963).

more about them, their attitudes became quite favorable in that they realized the strengths of the programs. An additional factor in this change of attitude was the provision of the periodic meetings for each of the two groups. Teacher comments at the end of the instructional period indicated that the meetings provided greater understanding of materials and an opportunity to exchange ideas and techniques.

During the course of the instructional period each group of seven teachers had a member of the research staff assigned to them. The role of the staff member in relation to the particular group involved the distributing of materials (texts, supplementary books, film strips, records, and tapes) as needed, aiding in the pre and post testing programs, observing instruction by the seven teachers in their individual classrooms, and collecting much of the common data agreed upon by the twenty-seven project directors. Of these duties it was felt that the observation of instruction was the most important. Each teacher was observed on an unscheduled basis every seven or eight days. It was felt by the project director that such observation of instruction was necessary in order to make certain the materials were being used as they were designed to be used by the three publishers. It was found that this was particularly important with the modified linguistic and linguistic teachers because of their lack of experience with such approaches. Furthermore, the observation of instruction provided a great many of the questions, problems, and techniques to be shared at the periodic meetings held with each group of teachers. It should be emphasized here that all three groups of teachers received the same type, quantity, and quality of attention and that the teachers

using the basic reading program also benefited from the periodic meetings with the research staff in that problems concerning materials and techniques were clarified.

Throughout the instructional period all teachers were encouraged to engage in sound basic instructional practices. That is, grouping procedures were used by all teachers in order to instruct children at a level commensurate with their ability and readiness to learn. Mastery of material taught was determined by all teachers before the children were moved to the next stage of their particular program. The research staff members in their observation of instruction paid particular attention to those individual children who seemed to have unusual difficulties with materials. Suggestions were made to the teachers on materials and procedures so that the emphasis and instructional level for these children could be adjusted.

As a result of these instructional practices used by the teachers, children of differing abilities and levels of maturity progressed at different rates through the materials of the three programs. Table II shows the placement of children in materials within three different treatment group classrooms at various times during the 140 day instructional period.

TABLE II

PROGRESS OF CHILDREN IN THREE TREATMENT GROUP CLASSROOMS

	Most Mature Children	Less Mature Children	Least Mature Children
Basal Reader Class*			
September	Readiness book	Readiness book	Experience level
December	Third pre-primer	Second pre-primer	First pre-primer
March	First reader	Primer	Third pre-primer
May	Enrichment reader	First reader	Primer
Modified Linguistic Class**			
September	Readiness book	Readiness book	Readiness book
December	Book B	Book B	Readiness book
March	Book C	Book B	Book B
May	Book D	Book C	Book B
Linguistic Reader Class***			
September	ABC book	ABC book	ABC book
December	Book 2	Book 1	Book 1
March	Book 4	Book 3	Book 2
May	Book 5	Book 4	Book 3

* Completion of the first reader is ordinarily expected of average and above average children by June of the first grade year.

** The authors expect first grade children to complete the Readiness Book, Book B, and Book C by June.

***By June of the first grade year children should complete Book 4.

Throughout the instructional period efforts were made by the research staff to hold constant the amount of time spent in instruction by each teacher. It is reasonable to assume that if unequal amounts of time were spent in direct instruction, this would be an influencing factor in producing achievement which could not be attributed to the materials as such. Therefore, it was recommended that each teacher in the experiment spend a total of ninety minutes per day in direct instruction using the particular materials to which she had been assigned. During a part of this time children would receive small group instruction while the remainder of the ninety minutes would be spent in independent seatwork activities stemming from the materials used for instruction in any particular classroom. It was also recommended that an additional thirty minute period each day be provided for the children to examine or read supplementary books in the classroom. It was noted that throughout the year all teachers attempted to follow these instructional time recommendations as closely as possible within the limitations set by the first grade curriculums of the three cooperating school systems. As a result of the observations by the research staff and the project director, it is felt that no one group of children experienced a total instructional time which was significantly greater than or less than that received by any other group.

Post-Testing of Sample

At the end of the 140 day instructional period two weeks were spent in post-testing the children in the twenty-one classrooms. During the five school days immediately following the instructional

period all children were administered the Stanford Achievement Test, Primary I Battery, Form X.[7] This widely-used instrument includes subtests of Word Reading, Paragraph Meaning, Vocabulary, Spelling, Word Study Skills, and Arithmetic. A measurement of attitude toward reading was accomplished by administering to all children the San Diego Pupil Attitude Inventory.[8] The Allyn and Bacon First Reader Test was also given to all children in the sample.[9]

A randomly selected subsample of thirty-five children from each treatment group was administered the following individual tests by the research staff:

Gilmore Oral Reading Test[10]

Fry Test of Phonetically Regular Words[11]

Gates Word Pronunciation Test[12]

Karlsen Phonemic Word Test[13]

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[7]Truman L. Kelley and others, Stanford Achievement Test, Primary I Battery, Form X (New York: Harcourt, Brace and World, Inc., 1964).

[8]An Inventory of Reading Attitude, Monograph No. 4 (San Diego: Department of Education, San Diego County, 1961).

[9]William D. Sheldon and others, Reading Achievement Tests, First Reader Test, Form I (Boston: Allyn and Bacon, Inc., 1963).

[10]John V. Gilmore, Gilmore Oral Reading Test (New York: Harcourt, Brace and World, Inc., 1952).

[11]Printed for use in the twenty-seven U.S.O.E. First Grade Studies.

[12]Printed for use in the twenty-seven U.S.O.E. First Grade Studies.

[13]Printed for use in the twenty-seven U.S.O.E. First Grade Studies.

Each teacher collected two writing samples from all children in the experiment after the instructional period ended. One sample was written during a twenty minute session with children following directions provided by a committee of project directors and the Coordinating Center staff. The second sample was elicited by a unique stimulus determined by the individual project director. Only those children who were administered the individual tests had their writing samples scored. This decision came from the Coordinating Center.

Once again, as with the pre-test instruments, all scoring was completed by the research staff and clerical workers. No teachers were asked to score tests.

Description of Materials

The children in the seven basal reader classes received instruction from the Ginn Basic Reading Series.[14] No other materials were used for instructional purposes. That is, all the instructional practices and materials used were those prescribed by the Ginn program. It was chosen for use in this study because it represents one of the most complete programs of its type in terms of materials and direction to the teacher. Its word analysis program at the grade one level is based on a composite of skills including phonic analysis, structural analysis, context clues and picture clues as presented in a readiness book, three pre-primers, a primer, and a first reader. The content of the readers follows a unit organizational pattern usually consisting

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[14]David H. Russell and others, Ginn Basic Reading Series (Boston: Ginn and Company, 1964).

of four or more stories and one or two poems. The unit themes attempt to give balance and variety to each of the readers. The teachers' manuals include chapters containing a philosophy of reading instruction, lesson plans for all the selections in the units, and suggested activities for both instruction and enrichment. Vocabulary is controlled in this series with 326 words introduced in grade one materials.

Seven classrooms of children received instruction of a modified linguistic nature as found in the Structural Reading Series.[15] The five worktexts in this series are designed as an approach to basic reading instruction during grades one and two. At the readiness level the sounds of the letters of the alphabet are introduced by means of key picture cards. The succeeding worktexts proceed to:

> take the familiar spoken word as the meaningful whole which the child must analyze before he reads the corresponding printed word. Following a carefully planned, extensively tested sequence, the program begins with the analysis of related groups of simple, monosyllabic words. After the child has gained insight into the structure of the written word man he discovers how to analyze related words such as pan, cat, map, bag, and sad. The program then moves on to the mastery of complex, phonetically related words. (Knowledge of the key word flower leads to an easy understanding of the related words power, tower, shower, etc.)[16]

The series is designed to be a complete language arts program with reading and writing being taught at the same time. From the very first page, the child practices writing. Listening and speaking are stressed throughout the materials beginning at the readiness level with work on vocabulary development, building background of experience,

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[15]Catherine Stern and others, Structural Reading Series (Syracuse, New York: L. W. Singer Company, Inc., 1963).

[16]Catherine Stern and others, Structural Reading Series, Book A, Teachers' Edition (Syracuse, New York: L. W. Singer Co., Inc., 1963), 5.

and hearing sounds of letters in the initial position of words. The publisher describes the program as being a modified linguistic approach; however, this material has been classified in the study by Bliesmer and Yarborough as that of a synthetic phonics program.[17]

The remaining seven classrooms used the linguistic readers of the Bloomfield-Barnhart approach. Bloomfield advocated this approach in the early 1940's but the first published lessons for the children did not become available until 1961.[18] This publication also included the original article by Bloomfield which explained his position on beginning reading instruction. In 1963, Barnhart made available an experimental student edition for use in classrooms.[19] It consists of nine readers with accompanying workbooks plus a readiness book which teaches the names of the letters of the alphabet. The series was chosen for use in this study because it represented the most complete program of its type available at the time this study was planned.

The ABC book and the nine readers represent a program designed to be completed in two years by an average class. After the child learns the names of the letters of the alphabet in the ABC book, he experiences instruction based on the following steps:

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[17]Emery P. Bliesmer and Betty H. Yarborough, "A Comparison of Ten Different Beginning Reading Programs in First Grade," Phi Delta Kappan, XLVI (June, 1965), 500-504.

[18]Leonard Bloomfield and Clarence L. Barnhart, Let's Read: A Linguistic Approach (Detroit: Wayne State University Press, 1961).

[19]Leonard Bloomfield and Clarence L. Barnhart, Let's Read (Bronxville, New York: C. L. Barnhart, Inc., 1963).

1. He spells and says short, regular words arranged according to the simplicity of form and grouped in patterns.

2. He spells and says words in pairs differing from each other in only a single letter and sound: cat, bat; cat, can; cat, cut. The child forms the habit of uttering the sounds "ordered" by a group of letters when he sees them.

3. He reads these words in simple contexts of common grammatical patterns.

4. After the child learns the regular words, irregular words grouped according to their spelling patterns are given.[20]

The nine readers differ in appearance from other beginning reading materials in a number of ways. There are no illustrations because Bloomfield felt that the child's attention should be directed to the association of letter to corresponding sound without the interfering factor of pictures which he felt led the child to use picture interpretation as an aid in reading words. The content of the stories in the early readers is restricted because only regular words are introduced. Observation of the children in the seven classrooms using these materials led the research staff to feel that the children were not disturbed by these restricted stories. Finally, there is no systematic development of comprehension skills found in this series because of Bloomfield's definition of beginning reading. He felt that at the initial stages the act of reading is only a decoding process.

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[20]Clarence L. Barnhart, "Bloomfield's Linguistic Approach to Reading" (Bronxville, New York: C. L. Barnhart, Inc., no date), 3 (Dittoed.)

Listening-Viewing Activities

A listening-viewing center was established in each of the twenty-one classrooms during the fall of 1964. Each center contained the following equipment:

1. a tape recorder
2. a film strip projector
3. a small screen (18" x 24")
4. a record player
5. a jackbox containing eight sets of headphones.

Each teacher was asked to select those children in her class who were least mature in listening and speaking skills with the maximum number to be no more than one-third of her group. The teacher provided this group with ninety minutes per week of activity utilizing the equipment listed above along with commercially available film strips, records, and tapes. In addition, teachers were urged to create their own tapes for use with this group. The listening-viewing activities were not a source of instruction per se. Rather, they were designed to be experiences in language. No formal skill development work was done by this lowest third using the equipment during the ninety minutes per week. However, teachers did, on other occasions, use the equipment for independent seat work stemming from the basic instructional materials in the classroom. Typical of the commercially available coordinated film strip and record were such children's stories as Grimm's Fairy Tales, Alice in Wonderland, and Tales by Hans Christian Andersen. *

*Available from Encyclopaedia Britannica Films, Inc.

Teacher made tapes were developed by recording children's favorite stories and asking older children to draw pictures of the recorded scenes.

Supplementary Reading

In an attempt to overcome the inconsistency in library services found among the various schools, each classroom was supplied with 100 trade books throughout the year. These books were written for children able to read on the first and second grade levels. Teachers provided thirty minutes per day for "free reading" of these books, and records were kept by teachers indicating the number of books read by each child. Most children, of course, were not able to cope with these materials on an independent basis until the second semester. It was felt by the project director that this supplementary reading time provided children with the opportunity to practice the skills acquired in the instructional program. Furthermore, the number of books read might be a significant outcome related to the particular instructional program the child experienced.

Description of the Communities

The four communities containing the classrooms involved in this study are described in Table III. One was a large urban community; the remaining three were suburbs of the urban community.

TABLE III

COMMUNITY CHARACTERISTICS FOR EACH EXPERIMENTAL CLASSROOM*

	Median No. of Years Education of Adults	Median Income of Family in Community or Census Tract	Population of Community	Type of Community
Basal Reader Program				
Classroom 1	12.1	$6200	216,000	Urban
Classroom 2	12.7	7400	216,000	Urban
Classroom 3	12.9	8200	12,000	Suburban
Classroom 4	12.9	8200	12,000	Suburban
Classroom 5	12.9	8200	12,000	Suburban
Classroom 6	11.9	6700	7,300	Suburban
Classroom 7	11.9	6700	7,300	Suburban
Modified Linguistic Materials				
Classroom 1	12.1	$7300	216,000	Urban
Classroom 2	12.0	6000	216,000	Urban
Classroom 3	12.5	6000	216,000	Urban
Classroom 4	12.9	8200	12,000	Suburban
Classroom 5	12.9	8200	12,000	Suburban
Classroom 6	11.9	6700	7,300	Suburban
Classroom 7	11.9	6700	7,300	Suburban
Linguistic Readers				
Classroom 1	8.8	$5000	216,000	Urban
Classroom 2	15.5	8200	216,000	Urban
Classroom 3	10.2	5600	4,700	Suburban
Classroom 4	10.2	5600	4,700	Suburban
Classroom 5	12.9	8200	12,000	Suburban
Classroom 6	12.9	8200	12,000	Suburban
Classroom 7	11.9	6700	7,300	Suburban

* Information in this table came from the 1960 census report.

Description of the School Districts

Information on the three cooperating school districts is found in Table IV.

TABLE IV

SCHOOL DISTRICT DESCRIPTION

	School District		
	A	B	C
Length of School Day	5 hours	5½ hours	5 hours
Length of School Year	184 days	186 days	184 days
No. of First Grade Rooms in District	17	13	103
ADA Cost per Pupil	$500-$599	$600-$699	$400-$499

Description of the Teachers

All of the twenty-one teachers involved in the experiment were female; thirteen were married, eight were single. Fourteen of them held the "standard" teaching certificate for this state; five held a "temporary" permit; two had earned a "higher-than-standard" certification. The degrees held by these teachers are given below:

4 -- less than the bachelor's degree

3 -- bachelor's degree

9 -- bachelor's degree plus graduate work

3 -- master's degree

2 -- master's degree plus additional graduate work.

All teachers with the exception of one had had previous first grade teaching experience. Additional information on the teachers is found below in Table V.

TABLE V

INFORMATION ON TEACHERS

	Basal Reader Teachers (N=7)	Modified Linguistic Teachers (N=7)	Linguistic Reader Teachers (N=7)
Average Age of Teachers (in years)	42.6	37.4	42.6
Average No. of Years of Teaching Experience	15.9	8.7	12.4
Average No. of Years of First Grade Teaching Experience	13.4	7.1	6.7

Description of the Sample

At the beginning of the study there were 497 children enrolled in the twenty-one cooperating classrooms. Of this number 467 were present at the end of the instructional period. All children had had kindergarten experience and some had attended nursery and/or church schools. The average number of students in the basal reader classrooms was 22.3 with a range of 17-27 students represented in the seven rooms. The modified linguistic groups averaged 23.4 children per class with a range of 16-30. For the linguistic reader classes

the average group size was 25.3 with a range of 22-29.

Further information on the sample of this study is found in the analysis of data in Chapter IV.

All the information on the communities, the school districts, the teachers, the children, etc. has been punched on cards and a duplicate deck of these cards has been put on file at the University of Minnesota Coordinating Center so that it is available for future use when studies are made of the entire twenty-seven programs.

CHAPTER IV -- ANALYSIS OF THE DATA

Introduction

The analysis reported in this chapter was made possible through use of the facilities of the Syracuse University Computing Center.[1]

A series of tests of intelligence, readiness, and reading achievement were administered to the children in the three treatment groups before and after the instructional period. Attendance of students, chronological age (as of October 1, 1964), and pre-school experiences of children were also recorded. In addition a measurement of the extent of outside reading, attitude toward reading, and proficiency in writing skills was attempted. Simple analysis of variance was used to compare treatment group means. Information on various subgroups including boys and girls and children at varying ability levels has also been collected.

Analysis of Pre-Experiment Status

Table VI includes information on pre-school attendance for the three treatment groups and the chronological ages of the groups as of October 1, 1964.

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[1]The work was supported in part by the National Science Foundation under Grant GP-1137.

TABLE VI

RESULTS OF THE ANALYSIS OF VARIANCE OF PRE-SCHOOL ATTENDANCE AND CHRONOLOGICAL AGE OF THE THREE TREATMENT GROUPS

	Basal Reader Program (N=7)	Modified Linguistic Materials (N=7)	Linguistic Readers (N=7)	F	Significance Level*
Pre-School Attendance	3.4**	3.2**	3.2**	1.31	Nonsignificant
Chronological Age (months)	75.1	75.5	76.4	2.26	Nonsignificant

* F.95 = 3.55, F.99 = 6.01 with 2 and 18 degrees of freedom

** This figure is the code provided by the Minnesota Coordinating Center and indicates that the mean pre-school attendance was between 101 and 200 half-days of kindergarten, nursery and/or church school experience.

As noted above there were no significant differences found between treatment group means on amount of pre-school attendance or chronological age. In addition to information presented in Table VI, it was found that all subjects had attended kindergarten while some had nursery and/or church school experience.

The Pintner-Cunningham Primary Test, Form A, was administered to all children before the instructional period began. It is an intelligence test designed for kindergarten, grade one, and the first half of grade two. The seven subtests are composed entirely of pictures and children mark these according to the oral directions of the examiner. The reported reliability is .89 between alternate forms; validity ranges

from .63 to .88 when correlated with the Stanford-Binet. Table VII gives the analysis of variance of treatment group raw scores and raw scores converted to mental ages.

TABLE VII

RESULTS OF THE ANALYSIS OF VARIANCE OF THE PINTNER-CUNNINGHAM RAW SCORE MEANS AND MENTAL AGE MEANS

	Basal Reader Program (N=7)	Modified Linguistic Materials (N=7)	Linguistic Readers (N=7)	F	Significance Level
Pintner-Cunningham Raw Score	41.6	39.4	37.6	1.61	Nonsignificant
Pintner-Cunningham Mental Age (months)	81.0	78.0	77.1	.76	Nonsignificant

Again no significant differences between treatment group means were found.

The Murphy-Durrell Diagnostic Reading Readiness Test, Revised Edition, was the first of three readiness tests given to all children before the instructional period began. It consisted of three subtests which were identification of phonemes in spoken words, identification of capital and lower-case letters by name, and learning rate for words. This test, at the time it was administered, was in the process of standardization.

The Metropolitan Readiness Test was the second instrument of its type administered to all children. Its subtests included measures of word meaning, listening, matching, alphabet, numbers, and copying.

This test was also in the process of standardization when it was given.

The last of the readiness tests was the Allyn and Bacon Pre-Reading Test, Form I, consisting of measures of auditory and visual discrimination skills, comprehension of stories read by the examiner, and children's performance on a perceptual-motor task. Reliability coefficients for the various parts of this test range from .57 to .96 with the total-score coefficient reported as .94.

Tables VIII, IX, and X report the results of the three readiness tests administered to all children.

TABLE VIII

RESULTS OF THE MURPHY-DURRELL DIAGNOSTIC READING READINESS TEST

	Basal Reader Program (N=7)	Modified Linguistic Materials (N=7)	Linguistic Readers (N=7)	F	Significance Level
Murphy-Durrell Diagnostic Reading Readiness Test					
Identification of Phonemes	33.6	26.2	28.8	1.93	Nonsignificant
Capital Letter Names	20.3	17.6	18.8	1.28	Nonsignificant
Lower-Case Letter Names	16.9	13.8	14.9	1.79	Nonsignificant
Total Letter Names	36.6	31.0	33.9	1.51	Nonsignificant
Learning Rate	10.7	9.5	10.1	1.01	Nonsignificant

TABLE IX

RESULTS OF THE METROPOLITAN READINESS TEST

	Basal Reader Program (N=7)	Modified Linguistic Materials (N=7)	Linguistic Readers (N=7)	F	Significance Level
Metropolitan Readiness Test					
Word Meaning	10.8	9.9	9.0	2.27	Nonsignificant
Listening	10.2	9.6	9.2	1.18	Nonsignificant
Matching	8.8	8.5	8.2	.23	Nonsignificant
Alphabet	10.6	9.2	9.5	1.24	Nonsignificant
Numbers	14.5	13.1	12.7	1.57	Nonsignificant
Copying	7.0	5.5	6.1	1.39	Nonsignificant
Total	62.0	55.6	55.0	1.34	Nonsignificant

TABLE X

RESULTS OF THE ALLYN AND BACON PRE-READING TEST

	Basal Reader Program (N=7)	Modified Linguistic Materials (N=7)	Linguistic Readers (N=7)	F	Significance Level
Allyn and Bacon Pre-Reading Test					
Auditory Discrimination--Rhyming Words	18.7	15.7	17.0	4.93	< .025
Auditory Discrimination--Initial Consonants	15.2	14.9	13.6	1.61	Nonsignificant
Visual Discrimination--Word Forms	17.6	15.9	16.7	2.23	Nonsignificant
Comprehension	14.9	14.4	14.1	.82	Nonsignificant
Total	65.7	61.0	61.5	1.70	Nonsignificant
Perceptual-Motor	30.1	30.8	30.9	.20	Nonsignificant

It should be noted that only one significant difference was noted in the eighteen scores of the three readiness instruments employed in this study. Furthermore, particular attention should be directed to the lack of significant differences between treatment groups in areas such as letter names and auditory discrimination skills which have been found by some experts in reading to be the best predictors of subsequent reading achievement.

Two other pre-experiment measures, the Thurstone Pattern Copying Test and the Thurstone Identical Forms Test, were given to all children in the study. Both were special printings of the instruments for use in the twenty-seven First Grade Studies. The Thurstone Pattern Copying Test consisted of thirty-six geometric and letter-like figures. Opposite each of these thirty-six figures was an incomplete pattern of the original. This test required children to complete each of the patterns by adding straight lines. The Thurstone Identical Forms Test was an attempt to measure speed of perception. Children were expected to select one of five forms which was identical to a stimulus form. The test contained sixty items and the directions for administering allowed three minutes for children to answer as many items as possible. Table XI contains the results of the two Thurstone tests.

TABLE XI

RESULTS OF THE THURSTONE PATTERN COPYING AND THURSTONE IDENTICAL FORMS TESTS

	Basal Reader Program (N=7)	Modified Linguistic Materials (N=7)	Linguistic Readers (N=7)	F	Significance Level
Thurstone Pattern Copying	9.9	7.7	10.1	1.88	Nonsignificant
Thurstone Identical Forms	17.3	15.7	14.3	2.67	Nonsignificant

Examination of Table XI shows that no significant differences were found between treatment group means on the two Thurstone tests.

The project director felt that there were no important differences in mental ability or readiness as indicated by the results of the pre-experiment measures discussed above.

Analysis of Post-Experiment Test Results

After the instructional period of 140 days ended, two tests of reading achievement were administered to all children in the twenty-one classrooms. The first of these was the Stanford Achievement Test, Primary I Battery, Form X, which was the chief instrument used for measuring reading achievement by all twenty-seven of the project directors. It contains six subtests:

1. Word Reading
2. Paragraph Meaning
3. Vocabulary
4. Spelling
5. Word Study Skills
6. Arithmetic

The Word Reading section asks children to look at a picture and then choose one of four words which tells what the picture depicts. Paragraph Meaning involves the reading of a story or paragraph with words missing and then choosing from four alternatives the correct word to fit the meaning of the story. The Vocabulary section has the student marking the correct response to a question and three alternatives read by the teacher. The Spelling subtest involves the writing

of twenty words dictated and used in sentences by the teacher. The Word Study Skills subtest is a measure of the ability of children to hear similar sounds in initial and final positions, to hear and read words with rhyming elements, and to choose from the printed test a word found among three alternatives read by the teacher. The Arithmetic section was also administered in an attempt to determine whether or not achievement in this area was reduced by the attention on reading instruction in the experimental classrooms. The reported reliability coefficients range from .79 to .95 for the six subtests of the Stanford Achievement Test. Table XII contains the raw score means and grade equivalencies for the three treatment groups on the Stanford Achievement Test, Primary I Battery, Form X.

TABLE XII

RAW SCORE MEANS AND GRADE EQUIVALENCIES
ON THE STANFORD ACHIEVEMENT TEST

	Basal Reader Program (N=7)		Modified Linguistic Materials (N=7)		Linguistic Readers (N=7)	
	Raw Score	Grade Equivalency	Raw Score	Grade Equivalency	Raw Score	Grade Equivalency
Stanford Achievement Test						
Word Reading	21.1	1.8	21.3	1.8	18.2	1.7
Paragraph Meaning	22.4	1.8	17.9	1.7	15.2	1.6
Vocabulary	24.8	2.4	21.9	2.1	21.7	2.1
Spelling	13.3	2.0	10.8	1.8	9.8	1.7
Word Study Skills	41.0	2.2	38.7	2.0	35.4	1.8
Arithmetic	45.3	2.1	39.8	1.9	40.9	1.9

The Stanford test was administered near the end of the eighth month of instruction and at that time a grade equivalency of 1.8 would be expected. The basal reader classes were at grade level or above on all measures. The modified linguistic classes were also at the expected level or above with the exception of the Paragraph Meaning subtest. The linguistic reader classes fell below the expected norm on three of the subtests--Word Reading, 1.7; Paragraph Meaning, 1.6; Spelling, 1.7.

The analysis of variance of the Stanford means is found in Table XIII below.

TABLE XIII

RAW SCORE MEANS OF TREATMENT GROUPS AND RESULTS OF THE ANALYSIS OF VARIANCE OF THE STANFORD ACHIEVEMENT TEST

	Basal Reader Program (N=7)	Modified Linguistic Materials (N=7)	Linguistic Readers (N=7)	F	Significance Level*
Stanford Achievement Test					
Word Reading	21.1	21.3	18.2	1.23	Nonsignificant
Paragraph Meaning	22.4	17.9	15.2	3.07	Nonsignificant
Vocabulary	24.8	21.9	21.7	1.39	Nonsignificant
Spelling	13.3	10.8	9.8	1.36	Nonsignificant
Word Study Skills	41.0	38.7	35.4	1.64	Nonsignificant
Arithmetic	45.3	39.8	40.9	.84	Nonsignificant

* F.95 = 3.55, F.99 = 6.01 with 2 and 18 degrees of freedom

On the Stanford test no significant differences were found on any of the six subtests.

The second test of reading achievement administered to all children was the Allyn and Bacon First Reader Test. It contains sections on vocabulary, word analysis, and comprehension and it yields nine scores including a total measure. Reported reliability ranges from .85 to .95 for the three sections and the total score.

Table XIV contains the results of the analysis of variance of treatment group means.

TABLE XIV

RESULTS OF THE ALLYN AND BACON FIRST READER TEST

	Basal Reader Program (N=7)	Modified Linguistic Materials (N=7)	Linguistic Readers (N=7)	F	Significance Level
Allyn and Bacon First Reader Test					
Vocabulary					
Recognition and Meaning	16.8	15.6	13.6	1.42	Nonsignificant
In Context	6.1	4.4	4.1	2.93	Nonsignificant
Word Analysis					
Letter Names--Consonants	17.7	17.8	17.7	.21	Nonsignificant
Initial Consonants--In Words	15.2	15.5	14.6	1.66	Nonsignificant
Consonant Substitution	9.5	9.4	8.8	1.41	Nonsignificant
Consonant Blends, Digraphs	7.4	6.9	5.3	4.79	<.025
Structural Analysis	10.0	9.5	9.4	2.21	Nonsignificant
Comprehension	13.0	11.2	9.4	2.16	Nonsignificant
Total	95.6	90.0	82.6	2.27	Nonsignificant

Only one significant difference was found in group performance on this test and that occurred on the Consonant Blends, Digraphs section which contained ten items.

In a further attempt to measure reading performance of children, a series of three word lists (see appendix A) and one oral reading test were administered to a randomly selected subsample of thirty-five children from each treatment group. These four tests were scored and administered to individual children by the three research staff members assigned to the three groups of teachers. The oral reading test chosen for use was the Gilmore Oral Reading Test, Form A, which yields an accuracy score in terms of a grade equivalency and a rate score reported in words per minute. The Fry and the Karlsen word lists were instruments containing phonemically regular--low frequency words while the Gates list consisted of irregular--high frequency words. The Fry and Karlsen lists were an attempt to measure performance based on the skills taught in the so-called regular word approaches. In this study, it would be expected that the children who had experienced the linguistic or modified linguistic materials would perform well on these two lists. The Gates list, on the other hand, was designed to measure the sight vocabulary of children using a typical basic reading program. The score on all of the word lists was the number of words read correctly.

Results of these four individually administered tests are found in Table XV.

TABLE XV

RESULTS OF THE ANALYSIS OF VARIANCE OF TREATMENT GROUP MEANS ON THE GILMORE, THE FRY TEST, THE GATES TEST, AND THE KARLSEN TEST

	Basal Reader Program (N=7)	Modified Linguistic Materials (N=7)	Linguistic Readers (N=7)	F	Significance Level
Gilmore Accuracy (Grade Equivalency)	2.67	2.33	1.64	3.66	$<.05$
Gilmore Rate (words per minute)	62.9	39.0	46.7	5.79	$<.025$
Fry Test	6.6	10.4	8.5	1.02	Nonsignificant
Gates Test	13.1	12.8	11.1	.34	Nonsignificant
Karlsen Test	12.1	12.6	9.3	.52	Nonsignificant

The accuracy score on the Gilmore test was found to favor the basal reader and modified linguistic group means when each was compared with the linguistic reader group mean. No differences were found between the basal reader and modified linguistic means. The analysis of the rate scores indicated that the basal reader group mean was significantly higher than the means of the other two treatment groups. When the modified linguistic and linguistic means were examined, a significant difference was found favoring the linguistic group.

Although no significant differences were found on the word lists, examination of the mean scores of the basal reader and modified linguistic groups indicates that the performance noted was consistent with the type of instruction received. This consistency in performance is

not shown in the means of the linguistic group. It would be expected that performance would be better on the regular lists than on the irregular (sight word) list. However, the reverse of this is found.

Two writing samples were collected from all children in the experiment after the instructional period ended. Only the sample given according to the Coordinating Center directions was analyzed. The second measure of writing using a stimulus provided by this project director was not examined because of errors in administration.

The Coordinating Center sample was collected by asking children to simply "write a story" without the teacher providing specific ideas or materials for motivation. Appendix B contains the specific directions given to the teachers by the research staff and the Coordinating Center.

Three scores were derived from the Coordinating Center directed writing sample. The first was a mechanics—ratio score which was the per cent of mechanics accuracy in the areas of capitalization, punctuation, and indentation. The second score was the total number of words spelled correctly and the third measure was the total number of running words. Following the direction of the Coordinating Center, only those children who were administered the Gilmore and the word lists had their writing samples scored. Therefore, the information contained in Table XVI below is based on the performance of thirty-five children in seven classrooms within each treatment group.

TABLE XVI

RESULTS OF THE RESTRICTED STIMULUS WRITING SAMPLE

	Basal Reader Program (N=7)	Modified Linguistic Materials (N=7)	Linguistic Readers (N=7)	F	Significance Level
Mechanics-Ratio (% of accuracy)	59.3	53.4	57.9	.21	Nonsignificant
Number of Words Spelled Correctly	20.3	28.1	19.5	1.82	Nonsignificant
Total Number of Running Words	25.3	35.4	24.7	2.14	Nonsignificant

No significant differences were found on the measure of writing performance although it could be expected that the modified linguistic group would be superior as a result of the teaching of reading and writing within the same instructional materials. Further examination of Table XVI shows that all three groups spelled about 80 per cent of the total number of running words correctly.

A measure of attitude toward reading was given to all children. The particular instrument used was the San Diego Pupil Attitude Inventory which consists of twenty-five questions read by the teacher to the entire class. Each child responds by marking "yes" or "no" on an answer sheet containing the questions and the responses. Table XVII gives the results of this measure of attitude toward reading.

TABLE XVII

RESULTS OF THE SAN DIEGO PUPIL ATTITUDE INVENTORY

	Basal Reader Program (N=7)	Modified Linguistic Materials (N=7)	Linguistic Readers (N=7)	F	Significance Level
Number correct out of twenty-five	18.0	18.4	18.9	.42	Nonsignificant

No differences between groups were noted on this test of reading attitude. There is some doubt in the mind of this writer concerning the effectiveness of the instrument used because some of the items are obviously not appropriate for first grade children. For example, questions concerning the reading of newspapers and catalogues probably do not apply to first grade children. However, this test might very well be quite appropriate at higher grade levels.

The teachers in this study were asked to record the number of books read by each child during the instructional period. The project director was aware of the difficulty involved in attempting a measure of this type when the teachers were not expected to check each child on each individual book. Furthermore, no attempt was made by the research staff to judge the maturity level or quality of the materials read by the children. In light of these limitations, caution should be exercised in interpreting the information contained in Table XVIII.

TABLE XVIII

MEAN NUMBER OF SUPPLEMENTARY BOOKS READ BY EACH CHILD DURING THE INSTRUCTIONAL PERIOD

	Basal Reader Program	Modified Linguistic Materials	Linguistic Readers
Number of books read by each child	7.8	11.4	4.8

A test of significance was not carried out on the means in Table XVIII. However, inspection indicates that the children in the modified linguistic program read more books than the children in the other two groups. This finding should be interpreted with caution because of the limitations cited above.

The one remaining factor in this study which would have a bearing on achievement of children was their attendance during the 140 day instructional period. Total number of days absent during the instructional period was recorded for each child and the analysis of this factor is presented in Table XIX.

TABLE XIX

ANALYSIS OF ATTENDANCE FOR THE THREE TREATMENT GROUPS DURING THE INSTRUCTIONAL PERIOD

	Basal Reader Program (N=7)	Modified Linguistic Materials (N=7)	Linguistic Readers (N=7)	F	Significance Level
Mean Number of Days Absent	8.8	8.4	9.7	1.21	Nonsignificant

As noted in Table XIX, there were no significant differences between treatment group means of number of days absent during the instructional period.

Achievement of Boys and Girls

Interest in the relative achievement of boys and girls prompted this project director to examine the data for these two groups. It is frequently claimed that the climate of the primary grade classroom is female oriented and that this condition hinders the achievement of boys. Furthermore, materials used in these classrooms have been criticized as being of little or no interest to boys.

Table XX contains the mean scores and standard deviations for boys and girls on selected pre-experiment measures used in this study.

TABLE XX

MEANS AND STANDARD DEVIATIONS FOR BOYS AND GIRLS ON SELECTED PRE-EXPERIMENT MEASURES

	Boys (N=233)*		Girls (N=234)*	
	Mean	Standard Deviation	Mean	Standard Deviation
Chronological Age (As of Oct. 1, 1964)	75.8	4.58	75.7	3.89
Pintner-Cunningham Mental Age (months)	76.6	12.93	81.1	15.05
Murphy-Durrell Ident. of Phonemes	28.4	13.21	30.8	13.97
Murphy-Durrell Capital Letter Names	17.9	7.23	19.9	6.70
Murphy-Durrell Lower-Case Letter Names	14.0	6.80	16.2	7.84
Murphy-Durrell Total Letter Names	31.6	13.22	36.0	12.89
Murphy-Durrell Learning Rate	9.7	4.34	10.3	4.13
Thurstone Pattern Copying	9.0	5.67	9.7	6.35
Thurstone Identical Forms	14.7	5.90	17.0	6.30
Metropolitan Word Meaning	10.0	2.93	9.8	3.00
Metropolitan Listening	9.6	2.51	9.8	2.47
Metropolitan Matching	8.2	3.46	8.8	3.37
Metropolitan Alphabet	9.0	4.16	10.4	4.29
Metropolitan Numbers	13.3	4.55	13.7	4.47
Metropolitan Copying	6.0	3.02	6.6	2.99
Metropolitan Total	56.2	15.12	59.3	15.54

* The total number in the sample varies slightly from one test to another.

Inspection of Table XX indicates that girls had slightly higher mean scores on fourteen of the fifteen test measures. Only the mean

score on the Metropolitan Word Meaning favored boys. The mean chronological ages of the two groups were almost identical.

Table XXI includes means and standard deviations for boys and girls on selected post-experiment measures.

TABLE XXI

MEANS AND STANDARD DEVIATIONS FOR BOYS AND GIRLS ON SELECTED POST-EXPERIMENT MEASURES

	Boys (N=233)*		Girls (N=234)*	
	Mean	Standard Deviation	Mean	Standard Deviation
Absence During Instructional Period	9.0	7.43	9.3	7.43
San Diego Pupil Attitude Inventory	18.1	4.09	18.8	3.90
Stanford Word Reading	19.8	7.22	20.7	7.42
Stanford Paragraph Meaning	17.7	9.49	19.4	9.61
Stanford Vocabulary	23.1	6.73	22.8	6.37
Stanford Spelling	10.9	6.36	12.0	6.30
Stanford Word Study Skills	37.2	9.91	39.6	10.03
Stanford Arithmetic	42.6	13.15	42.0	14.51

* The total number in the sample varies slightly from one test to another.

Once again the mean differences are quite small, and five of the seven test means favored the girls. Only on the Vocabulary and the Arithmetic subtests of the Stanford were boys found to have higher mean scores than girls. The mean number of days absent during the instructional period was slightly lower for boys.

Table XXII contains means and standard deviations for boys and girls on those post-experiment measures administered and scored for the randomly selected subsample of 105 children.

TABLE XXII

MEANS AND STANDARD DEVIATIONS FOR BOYS AND GIRLS ON POST-TESTS ADMINISTERED TO THE RANDOMLY SELECTED SUBSAMPLE

	Boys (N=45)		Girls (N=60)	
	Mean	Standard Deviation	Mean	Standard Deviation
Gilmore Accuracy (Grade Equivalency)	2.0	1.10	2.3	1.15
Gilmore Rate (words per minute)	46.0	26.17	52.4	25.82
Fry Test	8.5	8.37	8.7	7.18
Gates Test	12.1	7.61	12.7	7.11
Karlsen Test	10.6	9.52	12.1	9.68
Writing Sample Mechanics	51.9	27.37	60.9	24.14
Writing Sample Spelling	21.8	12.85	23.2	15.17
Writing Sample No. of Running Words	27.4	14.05	29.1	18.00

Table XXII indicates that the mean scores on the individually administered tests and the three scores derived from the writing sample were without exception higher for girls. As in the case of the pre- and the post-experiment group measures, the mean differences found were small.

The information in Tables XX, XXI, and XXII indicates that girls, as a group, had higher mean scores than boys on twenty-seven

of the thirty pre- and post-experiment measures. The boys' mean scores exceed that of the girls on only three subtests--Metropolitan Word Meaning, Stanford Vocabulary, and Stanford Arithmetic. The chronological ages and the mean number of days absent for the two groups were almost identical. No test of significance of means was carried out for these reported scores but by inspection it appears that the mean differences were consistently small.

Achievement of Boys and Girls According to Ability Levels

A further attempt to examine the differences in mean scores of boys and girls was accomplished by classifying children according to sex and ability level. The project director arbitrarily defined three ability levels as follows:

High -- those children who achieved a mental age of eighty-two months or higher on the Pintner-Cunningham Primary Test, Form A.

Average -- those children whose mental ages on the Pintner ranged from sixty-nine to eighty-one months inclusively.

Low -- those children with mental ages of sixty-eight months or less on the Pintner.

High ability boys and girls. Table XXIII includes means and standard deviations for high ability boys and girls on selected pre-experiment measures.

TABLE XXIII

MEANS AND STANDARD DEVIATIONS FOR HIGH ABILITY BOYS AND GIRLS ON SELECTED PRE-EXPERIMENT MEASURES

	Boys (N=69)*		Girls (N=106)*	
	Mean	Standard Deviation	Mean	Standard Deviation
Chronological Age (As of Oct. 1, 1964)	76.6	4.17	76.1	3.60
Pintner-Cunningham Mental Age (months)	92.5	9.26	94.1	10.64
Murphy-Durrell Ident. of Phonemes	36.5	10.44	39.0	9.12
Murphy-Durrell Capital Letter Names	22.5	4.62	22.4	5.39
Murphy-Durrell Lower-Case Letter Names	18.3	6.35	19.5	8.26
Murphy-Durrell Total Letter Names	40.5	9.11	41.4	10.75
Murphy-Durrell Learning Rate	12.0	4.78	12.2	3.95
Thurstone Pattern Copying	13.3	5.67	13.2	6.36
Thurstone Identical Forms	16.9	5.11	20.0	5.91
Metropolitan Word Meaning	11.4	2.74	11.3	2.36
Metropolitan Listening	10.6	2.61	10.8	2.14
Metropolitan Matching	10.6	2.86	10.6	2.60
Metropolitan Alphabet	11.4	3.70	12.4	3.36
Metropolitan Numbers	16.6	3.58	16.3	3.45
Metropolitan Copying	8.0	2.98	7.9	2.73
Metropolitan Total	69.2	11.37	69.4	9.80

* The total number in the sample varies slightly from one test to another.

Inspection of Table XXIII shows that the high ability boys were slightly older than the high ability girls and that the boys had higher mean scores than girls on five of the fifteen subtests. Girls were found to have higher means than boys on nine of the measures. The scores for the two groups were identical on the Matching section of the Metropolitan. In all cases the differences between means were small.

Table XXIV presents the means and standard deviations for high ability boys and girls on post-experiment measures.

TABLE XXIV

MEANS AND STANDARD DEVIATIONS FOR HIGH ABILITY BOYS AND GIRLS ON SELECTED POST-EXPERIMENT MEASURES

	Boys (N=69)*		Girls (N=106)*	
	Mean	Standard Deviation	Mean	Standard Deviation
Absence During Instructional Period	7.5	6.64	9.2	8.51
San Diego Pupil Attitude Inventory	17.9	4.33	18.9	3.83
Stanford Word Reading	24.7	7.12	24.4	6.02
Stanford Paragraph Meaning	24.4	9.94	23.7	8.75
Stanford Vocabulary	27.6	5.34	26.0	5.35
Stanford Spelling	14.7	5.27	14.8	5.01
Stanford Word Study Skills	44.4	8.25	44.7	7.16
Stanford Arithmetic	51.3	8.88	50.5	8.82

* The total number in the sample varies slightly from one test to another.

Table XXIV shows that high ability boys had a lower mean number of days absent than girls and that on four of seven measures boys had higher mean scores. The differences in means were small.

Information on the individually administered tests given to the high ability boys and girls appears in Table XXV

TABLE XXV

MEANS AND STANDARD DEVIATIONS FOR HIGH ABILITY BOYS AND GIRLS ON TESTS ADMINISTERED TO THE RANDOMLY SELECTED SUBSAMPLE

	Boys (N=12)		Girls (N=24)	
	Mean	Standard Deviation	Mean	Standard Deviation
Gilmore Accuracy (Grade Equivalency)	2.9	.95	2.9	.97
Gilmore Rate (words per minute)	68.5	24.06	66.8	22.33
Fry Test	13.6	9.53	10.6	7.36
Gates Test	17.8	7.77	15.6	6.95
Karlsen Test	17.2	9.67	16.2	10.26
Writing Sample Mechanics	68.7	23.07	60.5	24.86
Writing Sample Spelling	25.6	10.63	23.8	14.86
Writing Sample No. of Running Words	28.4	10.66	28.2	14.83

As noted in Table XXV, seven of the eight mean scores favored the high ability boys. On the remaining measure, Gilmore Accuracy, the two means were identical.

The information on high ability boys and girls presented in Tables XXIII, XXIV, and XXV is summarized below:

1. boys had higher mean scores than girls on sixteen of the thirty measures
2. girls had higher mean scores than boys on twelve of the thirty measures
3. mean scores on two measures, the Metropolitan Matching and the Gilmore Accuracy scores, were identical
4. boys were slightly older than girls
5. boys had a lower mean number of days absent during the instructional period than girls
6. it should be noted that seven of the eight scores derived from the testing of the subsample and reported in Table XXV showed higher means for boys
7. no test of significance of mean differences was carried out but inspection reveals that the differences were quite small in almost all cases.

Average ability boys and girls. The following section of this chapter deals with the findings on average ability boys and girls. Table XXVI presents information on pre-experiment measures for these two groups.

TABLE XXVI

MEANS AND STANDARD DEVIATIONS FOR AVERAGE ABILITY BOYS AND GIRLS ON SELECTED PRE-EXPERIMENT MEASURES

	Boys (N=102)*		Girls (N=74)*	
	Mean	Standard Deviation	Mean	Standard Deviation
Chronological Age (As of Oct. 1, 1964)	75.8	4.51	75.3	3.43
Pintner-Cunningham Mental Age (months)	75.0	3.72	76.7	3.02
Murphy-Durrell Ident. of Phonemes	28.4	12.33	30.1	11.18
Murphy-Durrell Capital Letter Names	17.8	7.12	20.1	6.17
Murphy-Durrell Lower-Case Letter Names	13.7	6.38	15.3	6.12
Murphy-Durrell Total Letter Names	31.3	12.95	36.0	11.58
Murphy-Durrell Learning Rate	9.7	3.84	9.7	3.53
Thurstone Pattern Copying	8.4	4.48	8.4	4.91
Thurstone Identical Forms	15.0	5.72	16.3	5.06
Metropolitan Word Meaning	10.1	2.52	9.9	2.59
Metropolitan Listening	9.8	2.10	9.7	2.34
Metropolitan Matching	8.2	3.08	8.5	2.68
Metropolitan Alphabet	9.0	3.90	10.3	3.96
Metropolitan Numbers	13.3	3.84	13.2	3.65
Metropolitan Copying	5.7	2.46	6.4	2.57
Metropolitan Total	56.2	11.28	57.9	11.32

* The total number in the sample varies slightly from one test to another.

Table XXVI shows that average ability boys are slightly older than average ability girls. On two of the test scores the means for the two groups were identical; boys had higher means in three areas; girls had higher means on ten of the fifteen measures.

Table XXVII presents the mean scores for the average groups on the post-experiment measures.

TABLE XXVII

MEANS AND STANDARD DEVIATIONS FOR AVERAGE ABILITY BOYS AND GIRLS ON SELECTED POST-EXPERIMENT MEASURES

	Boys (N=102)*		Girls (N=74)*	
	Mean	Standard Deviation	Mean	Standard Deviation
Absence During Instructional Period	9.4	7.45	9.4	6.16
San Diego Pupil Attitude Inventory	18.3	4.12	18.8	3.92
Stanford Word Reading	19.3	6.31	20.1	6.15
Stanford Paragraph Meaning	16.7	7.83	19.1	8.70
Stanford Vocabulary	23.2	6.16	22.6	5.35
Stanford Spelling	10.7	5.90	11.5	5.63
Stanford Word Study Skills	36.5	8.50	38.6	9.46
Stanford Arithmetic	42.8	12.15	40.3	13.01

* The total number in the sample varies slightly from one test to another.

Table XXVII shows that boys had higher mean scores on the Vocabulary and Arithmetic subtests of the Stanford. The remaining five test score means favored the average ability girls. The two means for number of days absent were identical.

Table XXVIII contains information on the individually administered tests given to average ability boys and girls.

TABLE XXVIII

MEANS AND STANDARD DEVIATIONS FOR AVERAGE ABILITY BOYS AND GIRLS ON TESTS ADMINISTERED TO THE RANDOMLY SELECTED SUBSAMPLE

	Boys (N=20)		Girls (N=20)	
	Mean	Standard Deviation	Mean	Standard Deviation
Gilmore Accuracy (Grade Equivalency)	2.2	1.13	2.4	1.01
Gilmore Rate (words per minute)	46.0	21.30	49.2	22.87
Fry Test	7.8	8.11	9.4	7.44
Gates Test	11.9	6.85	12.8	6.07
Karlsen Test	10.6	9.30	11.7	8.65
Writing Sample Mechanics	46.6	25.83	62.4	20.94
Writing Sample Spelling	24.0	14.21	26.1	18.75
Writing Sample No. of Running Words	30.3	16.70	33.3	25.31

It is found in Table XXVIII that all of the eight mean scores reported favor the average ability girls.

The information on average ability boys and girls presented in Tables XXVI, XXVII, and XXVIII is summarized below:

1. average ability girls had higher mean scores than average ability boys on twenty-three of the thirty measures.
2. boys had higher mean scores than girls on five of the thirty measures

3. mean scores on two measures, the Thurstone Pattern Copying and the Murphy-Durrell Learning Rate, were identical
4. boys were slightly older than girls
5. mean number of days absent during the instructional period were identical for the two groups
6. no test of significance of mean differences was carried out but inspection reveals that the differences were quite small in all cases.

Low ability boys and girls. Information on low ability boys and girls is presented on the following pages. Table XXIX contains means and standard deviations for boys and girls on pre-experiment measures.

TABLE XXIX

MEANS AND STANDARD DEVIATIONS FOR LOW ABILITY BOYS AND GIRLS ON SELECTED PRE-EXPERIMENT MEASURES

	Boys (N=62)*		Girls (N=54)*	
	Mean	Standard Deviation	Mean	Standard Deviation
Chronological Age (As of Oct. 1, 1964)	74.7	4.97	75.3	4.88
Pintner-Cunningham Mental Age (months)	62.3	4.54	62.2	5.10
Murphy-Durrell Ident. of Phonemes	19.8	11.81	16.2	12.73
Murphy-Durrell Capital Letter Names	13.2	6.60	14.9	6.95
Murphy-Durrell Lower-Case Letter Names	10.0	5.14	11.1	5.70
Murphy-Durrell Total Letter Names	22.7	11.10	25.8	12.22
Murphy-Durrell Learning Rate	7.4	3.25	7.6	3.41
Thurstone Pattern Copying	5.3	4.24	4.9	3.73
Thurstone Identical Forms	11.9	5.91	12.3	5.38
Metropolitan Word Meaning	8.2	2.81	7.0	2.57
Metropolitan Listening	8.1	2.35	8.3	2.46
Metropolitan Matching	5.8	2.89	5.9	3.40
Metropolitan Alphabet	6.4	3.48	6.8	3.86
Metropolitan Numbers	9.6	3.64	9.5	3.62
Metropolitan Copying	4.2	2.61	4.3	2.54
Metropolitan Total	42.3	11.11	41.7	12.84

* The total number in the sample varies slightly from one test to another.

Table XXIX shows that the low ability girls were slightly older than the low ability boys. On nine of the fifteen reported scores

girls had higher means than boys; boys had higher means on the remaining six of the fifteen measures.

Table XXX contains information on post-experiment measures for low ability boys and girls.

TABLE XXX

MEANS AND STANDARD DEVIATIONS FOR LOW ABILITY BOYS AND GIRLS ON SELECTED POST-EXPERIMENT MEASURES

	Boys (N=62)*		Girls (N=54)*	
	Mean	Standard Deviation	Mean	Standard Deviation
Absence During Instructional Period	9.9	8.07	9.1	6.85
San Diego Pupil Attitude Inventory	18.1	3.81	18.6	4.08
Stanford Word Reading	15.1	5.04	14.4	6.97
Stanford Paragraph Meaning	11.5	6.26	11.7	7.29
Stanford Vocabulary	17.8	5.18	17.0	5.11
Stanford Spelling	6.7	5.57	7.0	6.24
Stanford Word Study Skills	29.9	8.05	31.1	9.37
Stanford Arithmetic	32.4	11.64	27.7	13.28

* The total number in the sample varies slightly from one test to another.

Inspection of Table XXX indicates that boys had a higher mean number of days absent than girls. On three of the seven test scores boys had higher means than girls. The remaining four of the seven scores favored the girls.

Table XXXI contains results of the individually administered tests given to low ability boys and girls.

TABLE XXXI

MEANS AND STANDARD DEVIATIONS FOR LOW ABILITY BOYS AND GIRLS ON TESTS ADMINISTERED TO THE RANDOMLY SELECTED SUBSAMPLE

	Boys (N=13)		Girls (N=16)	
	Mean	Standard Deviation	Mean	Standard Deviation
Gilmore Accuracy (Grade Equivalency)	1.0	.55	1.5	1.15
Gilmore Rate (words per minute)	25.4	17.17	34.9	23.11
Fry Test	4.8	5.07	4.9	5.30
Gates Test	6.6	4.08	8.3	6.64
Karlsen Test	4.1	4.30	6.4	7.16
Writing Sample Mechanics	44.8	29.03	59.4	27.99
Writing Sample Spelling	14.0	9.47	18.4	9.22
Writing Sample No. of Running Words	21.1	10.39	25.3	9.24

All eight of the mean scores presented in Table XXXI were found to favor the low ability girls.

The information on low ability boys and girls presented in Tables XXIX, XXX, and XXXI is summarized below:

1. low ability girls had higher mean scores than low ability boys on twenty-one of the thirty measures
2. boys had higher mean scores than girls on nine of the thirty measures

3. girls were slightly older than boys
4. boys had a higher mean number of days absent during the instructional period than girls
5. the girls had higher mean scores than boys on all eight measures derived from the individual tests and the writing sample
6. no test of significance of mean differences was carried out but inspection reveals that the differences were quite small in all cases.

Summary of information on boys and girls according to ability levels. Examination of the information presented in Tables XXIII through XXXI indicates the following:

1. the chronological ages of boys and girls at all three ability levels are almost identical
2. differences in mean number of days absent between boys and girls at all three ability levels are negligible
3. at the high ability level neither boys nor girls exhibit a consistent superiority in the mean scores presented
4. at average and low ability levels a consistent superiority of mean scores is noted for girls
5. the mean differences between scores for boys and girls at all three ability levels are quite small.

Correlations Between Pre- and Post-Experiment Measures

A correlation matrix was computed for forty-seven variables. This matrix is presented in Table XXXII below and it contains correlation coefficients between pre-tests and post-tests.

Table XXXII was inspected for significant correlations. An r of .26 (P =.01 was the minimum r to be considered significant.

TABLE XXXII-- CORRELATION MATRIX *

MEASURE		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
Pint Mental Age	1		57	49	49	53	47	59	46	50	42	55	63	52	53	73	02	58	59	57	50	60	60	51	53	32	47	43	93	19	21	10	40	35	46	40	47	56	36	53	53	20	34	38	45	39	57	59
Dur-Mur Phonemes	2			56	50	59	43	42	35	48	37	42	57	41	57	66	02	61	60	59	57	66	62	54	52	39	51	51	60	17	16	07	36	42	63	36	47	62	30	61	58	25	38	43	52	39	57	66
Dur-Mur Cap Letters	3				74	95	49	37	27	40	36	43	60	41	80	72	02	56	57	50	54	60	52	47	46	37	49	47	51	08	17	02	28	33	38	33	34	46	29	56	52	24	35	37	40	30	47	56
Dur-Mur Low Case Let	4					84	49	33	26	36	33	37	56	40	73	66	03	54	54	42	48	50	45	55	49	45	56	55	47	04	22	07	28	25	37	32	31	42	27	48	47	16	27	33	33	26	46	50
Dur-Mur Total Letters	5						53	39	28	41	37	44	64	43	85	75	05	61	63	53	59	64	55	55	51	45	56	56	53	05	23	08	31	32	44	34	37	49	32	60	55	25	35	38	42	31	52	60
Dur-Mur Learn Rate	6							33	24	28	24	34	46	35	55	53	-08	48	52	36	41	44	41	43	36	40	43	47	44	02	20	12	24	20	27	30	26	35	28	39	43	13	17	19	28	24	39	41
Thurstone Pat Copying	7								30	33	28	42	44	58	37	56	02	41	38	36	37	41	45	37	33	34	38	38	56	15	06	-03	25	28	30	28	30	40	32	35	39	18	19	25	25	27	36	38
Thurstone Ident Forms	8									32	22	30	34	32	27	40	03	37	32	29	29	32	31	23	24	03	16	18	49	17	-06	-14	19	23	23	18	28	29	33	27	33	09	19	24	30	21	31	34
Metro Word Meaning	9										47	38	50	37	41	69	-02	49	49	60	44	50	51	44	33	29	37	37	52	21	23	18	26	37	45	30	49	54	27	50	42	19	38	41	45	31	49	54
Metro Listening	10											35	43	35	35	62	-02	35	41	43	34	39	40	30	27	19	26	30	44	12	16	07	16	26	31	20	36	36	22	38	31	10	25	29	32	28	37	40
Metro Matching	11												54	41	44	71	05	47	48	47	39	50	50	42	37	43	47	43	58	17	26	19	31	30	36	27	39	43	28	34	45	17	34	34	35	32	49	50
Metro Numbers	12													48	63	86	-05	56	60	56	52	59	65	43	38	31	41	46	65	-03	11	01	34	33	46	35	45	53	30	51	52	24	34	38	42	31	55	57
Metro Copying	13														41	67	03	34	38	34	28	38	39	26	27	14	24	23	51	08	12	04	22	37	28	25	27	40	34	31	36	12	15	20	21	30	33	35
Metro Alphabet	14															78	03	58	61	47	57	61	52	59	53	49	57	57	53	-06	23	14	30	30	44	36	37	49	29	56	53	24	33	37	43	30	52	58
Metro Total	15																00	66	70	70	59	52	45	57	58	75	10	26	14	37	44	54	41	54	64	40	63	61	25	42	46	51	42	64	69
San D Pupil Att Inv	16																	07	02	04	04	04	04	00	-03	-03	-02	-01	02	09	-02	-06	13	06	06	06	00	08	05	04	08	02	08	10	06	05	03	07
Stanford Word Read	17																		82	59	78	82	69	83	61	77	85	84	58	10	33	21	51	33	58	31	47	56	33	83	74	29	50	55	70	49	76	86
Stanford Par Meaning	18																			62	79	80	67	86	70	70	81	83	58	16	35	23	52	32	53	31	45	53	30	77	81	25	39	43	66	43	80	83
Stanford Vocabulary	19																				59	66	68	42	33	32	41	39	59	18	10	01	39	40	50	30	53	57	23	62	54	27	43	45	52	37	64	67
Stanford Spelling	20																					81	72	83	70	70	80	80	51	16	30	21	49	31	54	26	43	50	31	83	71	35	51	54	75	44	77	86
Stanford Word Study	21																						76	82	68	72	82	80	61	13	37	26	45	37	59	31	49	58	33	82	71	36	54	57	75	48	78	88
Stanford Arithmetic	22																							66	65	59	71	66	62	10	21	08	40	38	52	36	50	59	32	73	61	35	54	57	62	47	68	78
Gilmore Accuracy	23																								75	77	87	88	52	19	41	32	58	10	50	29	30	34	32	83	81	15	38	42	68	41	79	87
Gilmore Rate	24																									50	67	60	53	22	26	16	43	10	37	27	24	26	24	71	64	12	39	35	49	34	66	72
Fry Test	25																										88	91	30	11	39	31	50	-01	44	24	12	26	20	68	68	16	31	32	49	43	64	71
Gates Test	26																											92	46	17	36	26	56	09	52	28	22	36	24	82	77	16	39	40	61	51	78	85
Karlson Test	27																												42	10	35	25	52	05	52	27	25	32	30	77	79	17	34	34	59	46	74	80
Pint Raw Score	28																													21	24	13	36	43	48	43	52	62	40	57	50	24	42	46	47	45	58	63
Writing Sample Mech	29																														23	10	32	14	09	18	04	10	15	19	08	-05	18	13	05	07	26	19
Writing Sample Spell	30																														95	49	08	17	06	18	12	18	32	24	19	14	18	23	13	28	32
Writing Sample Words	31																															44	03	12	-01	15	07	08	22	11	20	08	14	17	01	14	20
No. of Books Read	32																															14	36	12	22	27	17	47	48	14	21	23	37	23	50	49
A&B Pre-Rhym Words	33																																31	32	39	69	22	33	31	16	28	30	27	37	26	36
A&B Pre-Init Cons	34																																	28	45	67	25	55	46	25	35	41	50	35	52	59
A&B Pre-Word Forms	35																																		32	72	25	29	28	14	21	20	23	25	25	31
A&B Pre-Comprehension	36																																			66	28	47	38	20	32	36	41	30	44	49
A&B Pre-Total	37																																				25	54	48	24	38	42	46	43	48	58
A&B Pre-Perc Motor	38																																					28	23	14	27	25	23	25	26	32
A&B 1st R Vocab Recog	39																																						72	31	53	59	75	49	77	93
A&B 1st R Voc in Cont	40																																							16	30	34	62	38	75	79
A&B 1st R Let Names	41																																								59	43	27	26	22	40
A&B 1st R Init Cons	42																																									78	50	44	40	65
A&B 1st R Cons Subs	43																																										58	48	47	70
A&B 1st R Cons Blends	44																																											38	67	83
A&B 1st R Struc Anal	45																																												46	59
A&B 1st R Comprehen	46																																													88
A&B 1st R Total	47																																													

* Based on individual observations. Decimal points omitted to save space.
P =.01 when r =.26 or higher

CHAPTER V -- RESULTS, CONCLUSIONS, AND IMPLICATIONS

Introduction

The main purpose of this study was to determine the effect of three different approaches to the teaching of beginning reading as measured by the achievement of children at the end of grade one. Data was also collected for boys and girls at varying ability levels and relationships between readiness test scores and subsequent achievement were noted.

Twenty-one classrooms of children in three central New York school districts participated in this study during the 1964-65 academic year. Three treatment groups of seven classrooms each were formed by randomly assigning each classroom to one of the following approaches:

1. a basal reader series
2. a modified linguistic program
3. a linguistic reader series

The year began with an extensive pre-experiment testing program and concluded with the administration of post-experiment measures. The instructional period between pre- and post-testing lasted for 140 days.

Results

A series of six tests were administered to all children before the instructional period began. The results of these measures and other information on the sample appear below:

1. Amount of pre-first grade attendance for the children in the three treatment groups was analyzed. No significant differences between means for the groups were found.
2. No significant differences were noted between chronological age means for the three treatment groups.
3. An intelligence test was administered and the analysis of results indicated no differences between groups in ability.
4. Three readiness tests were given and only one significant difference was noted on the eighteen subtests of the three measures. This one significant difference was on the Auditory Discrimination--Rhyming Words section of the Allyn and Bacon Pre-Reading Test.
5. No significant differences were found on the analysis of the Thurstone Pattern Copying and Thurstone Identical Forms scores.

Examination of the results of the pre-experiment measures indicates that no significant differences between groups were present at the beginning of the instructional period.

The post-experiment measures included two achievement tests and a reading attitude inventory which were administered to all children in the study. Three word lists, an oral reading test, and a writing sample were given and scored for a randomly selected subsample of thirty-five children from each treatment group. The results of these measures and other information collected on the performance of the subjects appear below:

1. The major measure of reading achievement was the Stanford Achievement Test, Primary I Battery, Form X. Analysis of variance of the mean scores for all of the subtests showed no significant differences between treatment group means. Raw scores on the six subtests were converted to grade equivalency scores and it was found that the basal reader classes were at or above the expected grade norm (1.8) on all subtests. The modified linguistic classes were at or above the expected norm on five of the six tests. On the Paragraph Meaning subtest the grade equivalency for the modified linguistic classes was 1.7, one month below the expected norm. The linguistic reader classes were below the 1.8 norm on three subtests. These included Word Reading, 1.7; Paragraph Meaning, 1.6; and Spelling, 1.7.
2. No significant differences were noted on the analysis of variance of eight of the nine scores derived from the Allyn and Bacon First Reader Test. On the ninth score a significant difference was found on the Consonant Blends, Digraphs subtest.
3. The accuracy score on the Gilmore Oral Reading Test was found to significantly favor the basal reader and modified linguistic group means when each was compared with the linguistic reader group mean. No differences were noted between the basal reader and modified linguistic means.
4. The analysis of the rate scores on the Gilmore indicated that the basal reader group mean was significantly higher than the means of the other two treatment groups. When

the modified linguistic and linguistic means were examined, a significant difference was found favoring the linguistic group.

5. No significant differences were found between mean scores for the treatment groups on the three word lists.
6. The analysis of the writing sample produced no significant differences.
7. No differences between treatment group means were found on the reading attitude inventory.
8. Attendance during the instructional period was recorded for each subject. Analysis of variance showed no significant differences on this factor.
9. Number of supplementary books read by each child was recorded by the teachers. It was found that children in the modified linguistic classes read more books than children in the other two treatment classes.
10. Comparison of mean scores of boys and girls showed a consistent, but small, superiority favoring the girls.
11. When the subjects in this study were classified according to sex and ability levels, differences in mean scores were negligible for high ability boys and girls. At the average and low ability levels the girls again exhibited a consistent, but small, superiority on the measures used in this study.
12. It was impossible to measure the effect of listening—viewing experiences on the achievement of those children in each classroom who were considered least mature in listening

and speaking skills. However, teacher comments indicated that these children made marked progress in language skills during the year. Furthermore, many of the teachers decided to continue the listening--viewing procedures in their classrooms during the following year.

Conclusions

The results of this comparison of three approaches to the teaching of beginning reading indicate that no one of the approaches was more effective than the others in teaching children to read. Examination of the three treatment group means on various achievement measures showed that children did learn to read at an acceptable level. No one approach was completely successful for all children using it. That is, within each of the three treatment groups some children failed to learn to read.

When the mean scores of the classrooms within each treatment group were inspected, it was found that large differences existed. Whether these differences were a result of the nature of the group, the teacher variable, or some other factor is not known at this time.

Implications for Further Study

1. Because of the great range of differences noted in the class means within treatment groups, further study of factors other than methods and materials seems to be necessary. The most obvious of these factors is the teacher variable; another concerns more thorough measurement of the nature of the sample with emphasis placed on the possible effect

of environmental influences, school climate, and classroom climate.

2. In this study there were consistently higher mean scores for the group receiving the basal reader instruction. Whether this can be attributed to the nature of the testing instruments used is another possible area of investigation. That is, to what degree do the testing instruments currently available favor basal reader taught children as compared to children who have experienced a phonics program or an approach based on grapheme-phoneme relationships? Inspection of the more popular standardized reading achievement tests indicates that the vocabulary used to measure skill development is that which is found in a typical basal reader series as compared to the type of vocabulary found in regular-word approaches.

3. The data collected in this study showed consistently higher achievement by girls at average and low ability levels. Further investigation is necessary to determine causes of this condition, which has been reported in numerous studies. Attention of the investigator should be directed to possible changes in methods and materials, time at which instruction begins, and the contributing effect of the female-oriented primary grade classroom on the achievement of boys.

4. This study was an attempt to determine the effects of three approaches to teaching reading as indicated by achievement

of children at the end of grade one. It is quite possible that at the end of a second year of instruction dramatic changes in the achievement of the three treatment groups could occur. This is particularly true in this study in that both the modified linguistic approach and the linguistic reader series are designed to be completed by children in approximately two years. At the present time the United States Office of Education is supporting a continuation study through the second year of instruction with the sample and procedures remaining the same as those during the first year. Results of the second year will appear during January, 1967, under the following title:

"A Comparison of Three Methods of Teaching
Reading in the Second Grade"
Cooperative Research Project No. 3231
William D. Sheldon, Project Director

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APPENDIX A

Instructions for Restricted Stimulus

Writing Sample

First Grade Written Language Measures
USOE Cooperative Research Project

Directions to the Classroom Teacher

General Information

You are being asked to obtain two writing samples from each pupil in your classroom. We wish to emphasize the necessity of following the directions and procedures exactly.

As you realize, many other teachers throughout the nation will also be asked to obtain writing samples from their pupils. It is necessary, therefore, that these samples be obtained in all classrooms at approximately the same time and by following the same directions.

You are requested to obtain the first writing sample (Restricted Stimulus Measure) on May 21, 1965.
(Project Director Specifies Date)

DIRECTIONS --- RESTRICTED STIMULUS MEASURE

Classroom Situation

No attempt should be made to enrich your normal room display through the use of word lists, pictures, dictionaries, etc. The classroom conditions should approximate those normally found in your daily writing activities.

Materials

The writing paper and pencils customarily used in your classroom should be used in obtaining this sample.

Identification

The pupil's name, teacher's name, and the school should be indicated on each pupil's paper. In some cases, you might initial the back of each paper, or a code number may be assigned by your Project Director.

Teacher Directions to the Pupils

You are requested to spend a minimum amount of time motivating the class to write a story. This motivation should consist of:

1. General encouragement to the whole class that you are interested in reading their stories and that they are to use their very best handwriting.
2. Additional encouragement to individual pupils by such directions as:

   "I'm sure you have an interesting story you would like to write for me today, Billy."

   "Sally, I'll bet you have a really good story you would like to write for me."

   "I liked that story you wrote for me last week, Mary. I'm sure you could write another one for me. Let's try."

This additional motivation should be of a general type and should be directed toward getting the pupils to write rather than in providing them with specific ideas.

It is particularly cautioned that no specific titles be presented, nor should pictures or other stimuli be employed.

Other Procedures

No spelling help should be provided during the writing period.

If pupils request spelling assistance, they should be told to try to spell the word and then encouraged to proceed.

If pupils normally use a simplified dictionary or write from displayed flashcards or use a speller, such practices may be allowed.

Under no circumstances, however, should you correct misspellings, give ideas, or assist the pupil beyond the point of general encouragement.

Time Limit

Following the heading of the paper, twenty minutes should be allowed for the pupils to finish their stories. Papers of pupils who finish early should be inconspicuously collected and a coloring exercise or similar silent activity should be provided for the remainder of the twenty minutes.

Written Sample Identification

At the end of twenty minutes, all stories should be collected, packaged, and clearly labeled:

RESTRICTED STIMULUS SAMPLES (Date May 21, 1965)

You are not to correct these stories; they will be corrected and scored by the Project Director's Staff who will apprise you of the correction procedures should you desire this information.

APPENDIX B

Word Lists Administered to Randomly Selected Subsample

GATES WORD PRONUNCIATION TEST

EXAMINER'S COPY

Directions: Have the child read the words out loud. Tell him you would like him to read some words for you. If he fails the first time, ask him to try the word again. Continue until ten consecutive words have been missed. As the words become difficult, special care should be taken to encourage the child. The score is one point for each word correctly pronounced on the first trial, one-half point for each word correctly pronounced on the second trial. (Note: 9½ correct would be scored as 10.

1. so	14. about	27. conductor
2. we	15. paper	28. brightness
3. as	16. blind	29. intelligent
4. go	17. window	30. construct
5. the	18. family	31. position
6. not	19. perhaps	32. profitable
7. how	20. plaster	33. irregular
8. may	21. passenger	34. schoolmaster
9. king	22. wander	35. lamentation
10. here	23. interest	36. community
11. grow	24. chocolate	37. satisfactory
12. late	25. dispute	38. illustrious
13. every	26. portion	39. superstition
		40. affectionate

Child's name: _____ Test date ___ ___ ___

Examiner: _____ Birth date ___ ___ ___

Age: _____

KARLSEN PHONEMIC WORD TEST

EXAMINER'S COPY

Directions:
1. Hand the PUPIL'S COPY to the pupil.
2. Say: "Read these words out loud."
3. Note the pupil's errors on this sheet.
4. Do not give the pupil a second chance, but accept immediate self-correction.
5. Continue until the child misses 5 consecutive words.
6. The score is the number of words pronounced correctly.

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1. fit	14. gold	27. snowball
2. tap	15. freeze	28. thirteen
3. rod	16. chair	29. scare
4. get	17. mouth	30. sunshine
5. would	18. carry	31. gymnasium
6. mother	19. hope	32. join
7. down	20. beat	33. usual
8. age	21. loaf	34. zone
9. think	22. cowboy	35. teaspoon
10. long	23. furniture	36. monument
11. kind	24. page	37. senior
12. yard	25. push	38. flute
13. foot	26. huge	39. behave
		40. faucet

Child's name: _____ Test date ___ ___ ___

Examiner: _____ Birth date ___ ___ ___

Age: _____

FRY PHONETICALLY REGULAR WORDS ORAL READING TEST

Child's Name _____ Date _____

School _____ Room _____ Code Number _____

Examiner _____ Number of words read correctly _____

1. nap	16. walk
2. pen	17. haul
3. hid	18. jaw
4. job	19. soil
5. rug	20. joy
6. shade	21. frown
7. drive	22. trout
8. joke	23. term
9. mule	24. curl
10. plain	25. birch
11. hay	26. rare
12. keen	27. star
13. least	28. porch
14. loan	29. smooth
15. show	30. shook

Directions: Have pupil read words from one copy while examiner makes another copy. Do not give pupil a second chance but accept immediate self-correction. Let every student try the whole first column. If he gets two words correct from word number six on, let him try the whole second column.